

## THE TEXAS SPECIES OF PARONYCHIA (CARYOPHYLLACEAE)

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Attempts to ascertain the biological and/or nomenclatural status of putative endangered taxa of Paronychia for the state of Texas occasioned the present paper. In particular, I wanted to know if the several species described by the late D. S. Correll subsequent to the monograph of Paronychia by Chaudhri (1968) were valid taxa. The names concerned are P. maccartii, P. congesta and P. nudata. In my efforts to ascertain their status I was inevitably led to an overall study of the genus in Texas and adjacent regions, especially Mexico. This was accomplished by drawing heavily upon the treatment of Chaudhri (1968) and upon that of Correll (1970) for the Flora of Texas. In addition, I studied all of the Texas and Mexico collections of Paronychia from the four largest herbaria in the state of Texas, namely LL, SMU, TAES and TEX. Altogether over 800 sheets from Texas and Mexico were examined, as follows:

LL, C. L. Lundell Herbarium, Austin	250
SMU, Southern Methodist University, Dallas	153
TAES, Texas A & M University, College Station	95
TEX, University of Texas, Austin	310

All of the material was duly annotated and Figures 1 and 2, showing the distribution of the species in Texas have been prepared from these. Where collections are relatively few in herbaria these are represented in the figures by appropriate site-symbols; where collections are numerous over a broad area, these are shown by general shading or lining.

In the presentation here I saw no reason to duplicate again the careful descriptions rendered by Chaudhri and Correll. At most any "emended" description would merely call attention to a relatively minor, usually highly variable, character which this or that key emphasized to vouchsafe a given species. I have therefore confined my observations to the major questions: How many species of Paronychia are there in Texas? How can they be recognized? And what are their distributional relationships?

In my pursuit of the answers I have examined types of all of the critical taxa, visited their type localities several times and observed numerous populations elsewhere. Because of this I feel confident that the treatment rendered here is biologically sound.

The last comprehensive treatment of Paronychia for Texas was that of Correll (1970) who recognized 15 species for the state. In this he more or less accepted the same species as Chaudhri (1968) but added, as already noted, an additional three species: P. congesta, P. maccartii and P. nudata. I have reduced the latter name to synonymy under the relatively widespread P. monticola but have had to accept, albeit reluctantly, the specific status of the former two.

Paronychia maccartii is known only from the type collection. It is quite distinct, superficially resembling the more western P. wilkinsonii, but readily distinguished by a number of characters. Paronychia congesta, is also known only by collections from the type locality. It is superficially similar to the widespread, variable, P. jamesii, but is isolated from the range of that species and possesses several quite distinct characters. In spite of numerous attempts to locate again populations of P. maccartii, I have not succeeded in this endeavor. I was able to relocate a few living plants of P. congesta, but only with much effort.

I am confident that P. maccartii still lives on somewhere in the vicinity of its type locality and urge future workers, interested amateurs even, to locate living plants of the species so that the plant might legitimately be listed as an "endangered" taxon. Without recently sighted populations (i.e., an authoritative recent account of its existence in nature) the U. S. Wildlife Service will not submit such plants for listing. At least such is the case for another south-Texas endemic, Manihot walkerae Croizat. In spite of the potential of the latter species for the genetic improvement of the important crop plant, M. esculenta (cassava), this agency would not list the plant as "endangered" since the present author could not locate natural populations of the species in his preparation of a report for that agency. The species was last collected in 1947 in La Jolla, Texas; while rare at the time it surely exists somewhere in that area today, and were sufficient efforts made to locate the plant the species might still be placed on the "endangered" list. But such are the foibles of government agencies.

Incidental to my excursion into the status of Correll's several names, I found it necessary to sink yet two other names recognized by Correll (P. chorizanthoides and P. parksii) and add a new species to the genus, P. lundellorum, described herein.

Overall then, I recognize 13 species for the state. Their distribution is shown in Figures 1 and 2. The taxa are keyed below and additional comments upon the treatment rendered are given in the specific discussions that follow.

I am grateful to the Directors concerned for the loan of

herbarium materials, to Dr. M. C. Johnston for the Latin diagnosis and to Gayle Turner for the sketches provided. However inadequate, the U. S. Department of the Interior, U. S. Fish and Wildlife Service, Albuquerque, New Mexico, supported, in part, field work for the present study.

Key to Texas species of Paronychia

1. Annual species, stems arising from a single, usually unbranched taproot.
  2. Leaves variously elliptical to oblanceolate, 2-5 mm wide.
    3. Calyx glabrous or nearly so, 0.8-1.2 mm long; sepals unmarginated with an ill defined mucro 0.1 mm long or less..... 1. P. fastigiata
    3. Calyx variously pubescent, especially below, 1.5-2.5 mm long; sepals with prominent white scarious margins.
      4. Stems prostrate; calyx with at least a few decidedly enlarged, uncinat hairs..... 2. P. jonesii
      4. Stems erect; calyx rather uniformly pubescent with uncinat hairs..... 3. P. drummondi
  2. Leaves narrowly linear, 1 mm wide or less
    5. Sepals with definite and distinctive white scarious margins; stems very hispid throughout; plants of sandy soils in eastern southcentral Texas.....4. P. setacea
    5. Sepals not as above; stems mostly minutely hispid to nearly glabrous; plants of

various soils on the  
Edwards Plateau in central  
Texas.....5. P. lindheimeri

1. Perennial species, stems usually arising from a branched, thickened, caudex or persistent root-stock.

6. Flowers sessile at the tips of Lycopodium like stems; stems short with uniformly shortened internodes, each leaf overlapping at least 2 or more nodes.

7. Apex of sepals merely mucronate or short awned, not at all snowy white; margin of the sepals not noticeably scarious; panhandle Texas.....6. P. sessiliflora

7. Apex of sepals terminated by a snowy white appendage; margins of sepals scarious and snowy white

8. Leaves shorter than the stipules; sepals without an inner tuft of white hairs below the hood; awns of calyx 1.5-2.0 mm long; plants of trans-Pecos Texas.....7. P. wilkinsonii

8. Leaves longer than the stipules; sepals with an inner tuft of white hairs below the hood; awns of calyx 0.9-1.2 mm long; plants of southern Texas..8. P. maccartii

6. Flowers not as above, clearly borne in terminal, open or somewhat congested numerous flowered, corymbose panicles.

9. Sepals triangular lanceolate, prominently 3 ribbed, 3.0-5.0 mm long; plants mostly 30-50 cm tall.....9. P. virginica

9. Sepals not as above; plants mostly 5-20 cm tall

10. Calyx evenly hispid

pubescent throughout;  
 sepals gradually tapering  
 into a straight awn.....10. P. congesta

10. Calyx glabrous or unevenly  
 pubescent, the united  
 portions more prominently  
 strigose; sepals usually  
 abruptly terminated by a  
 divergent awn.

11. Sepals, excluding the  
 awn, less than 2 mm  
 long with a clearly  
 defined scarious  
 yellow margin; plants  
 of sandy soils in  
 southern Texas.....11. P. lundellorum

11. Sepals, excluding the  
 awn, 2-3 mm long,  
 without a clearly  
 defined scarious yellow  
 margin; plants of various  
 soils in western Texas.

12. Foliage glabrous or  
 nearly so; sepals  
 glabrous; plants  
 with usually a  
 single unbranched  
 tap root.....12. P. monticola

12. Foliage variously  
 hispid or hispidulous;  
 sepals pubescent;  
 plants with usually  
 a well developed  
 branched caudex.13. P. jamesii

1. *PARONYCHIA FASTIGIATA* Fern. (1936)

This is a widespread delicate annual of the eastern United States. It is represented in Texas by relatively few collections (Fig. 1) from the northeastern most regions of the state where it occurs in sandy soils.

2. *PARONYCHIA JONESII* M. C. Johnst. (1963)

This species is recognized by both Chaudhri (1968) and Correll (1970). It is a weakly differentiated taxon very closely

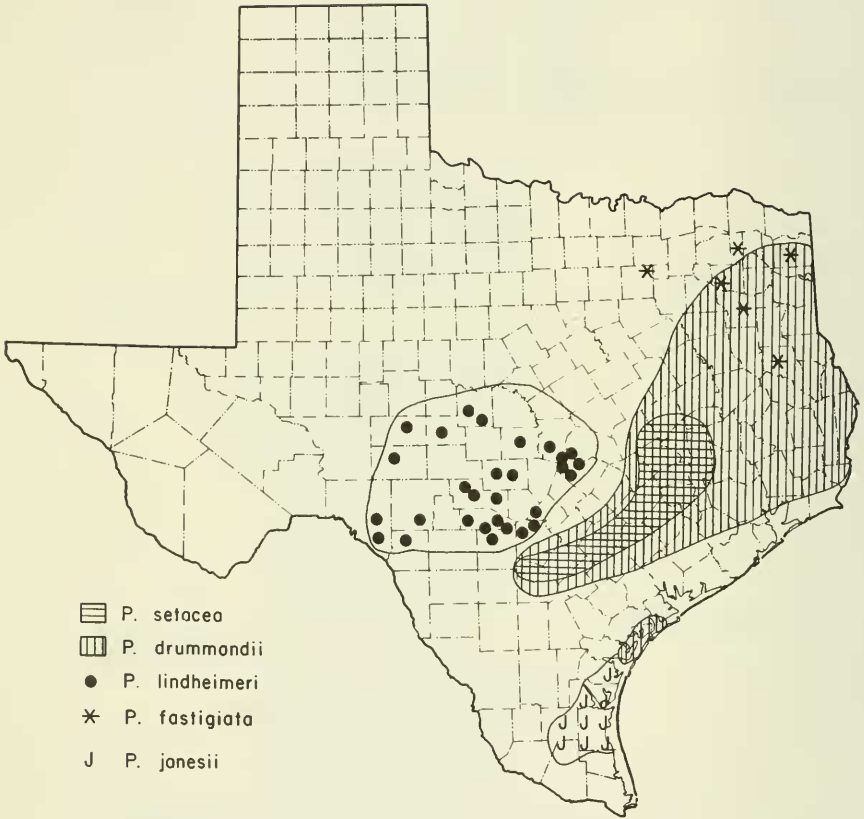


Fig. 1. Distribution of annual species of Paronychia in Texas.

related to *P. drummondii* but readily distinguished by its prostrate stems and somewhat enlarged strigose calyx hairs. In the dune sands just north of Corpus Christi, erect-stemmed populations referable to *P. drummondii* occur but it is likely that these are relic progenitor populations that gave rise to *P. jonesii* there being otherwise no clear distinctions between the two taxa in this area.

3. PARONYCHIA DRUMMONDII T. & G. (1838)  
*Paronychia drummondii* subsp. *parviflora* Chaudhri (1968)

Chaudhri recognized two weakly differentiated subspecies (subsp. *drummondii* and subsp. *parviflora*) within this taxon and these are "keyed" by Correll (1970, quoting Chaudhri, 1968). In my opinion the "subspecies" are not deserving of nomenclatural rank, there being a wide range of intermediates over a broad area between the putative taxa. In general, less pubescent plants with smaller flowers occur in the northeastern regions of the state (northwest of about Austin, Texas) while somewhat more pubescent plants with larger flowers occur in central and south central Texas. This might suggest varietal status for the populations concerned but such regional recognition would distort Chaudhri's concept of the subsp. *parviflora* (which was represented, as inferred from his description and specimen-citations, by relatively few atypical collections from northeastern Texas). Considering this fact, and the large number of intermediates to be found between such forms in northeastern Texas, it seems meaningless to recognize the extremes.

4. PARONYCHIA SETACEA T. & G. (1938)

The type material of this relatively delicate annual was collected by Drummond in sandy soils of east-central Texas. It is most easily distinguished from *P. lindheimeri* (with which it has been confused, at least in part, by nearly all previous workers) by its very pubescent foliage and scarious-margined sepals.

5. PARONYCHIA LINDHEIMERI Engelm. ex Gray (1850)  
*Paronychia chorizanthoides* Small (1897)

This taxon is largely restricted to central Texas on the Edwards Plateau or within the Central Mineral Region where it occurs in either calcareous or sandy soils and mixtures thereof. In my opinion it includes as a synonym *P. chorizanthoides*, although Core (1943), Chaudhri (1968) and Correll (1970) maintained the species. The type of Small's name is from Burnet County and is said to be distinguished from the sympatric *P. lindheimeri* by "having longer sepal awns and a somewhat longer style (Chaudhri, 1968; p. 180). These are highly variable characters at best and such plants represent but segregate forms

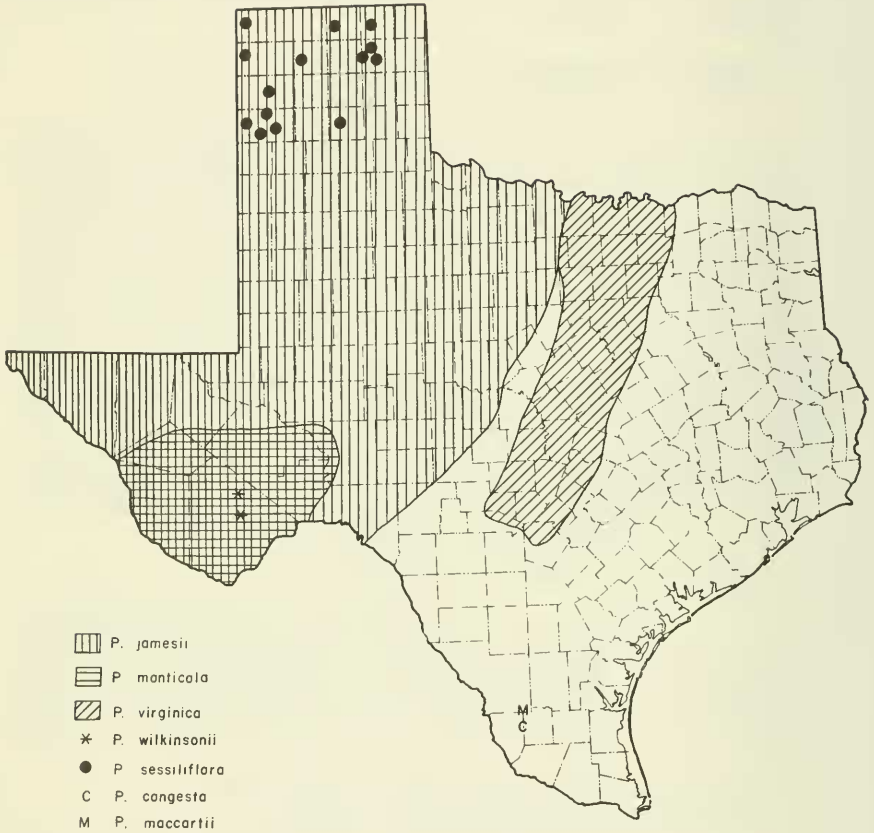


Fig. 1. Distribution of perennial species of *Paronychia* in Texas.



of *P. lindheimeri*.

6. *PARONYCHIA* *SESSILIFLORA* Nutt. (1818)

This species is readily recognized and is apparently fairly common in the rocky breaks of the Panhandle region of Texas (Fig. 2).

7. *PARONYCHIA* *WILKINSONII* S. Wats. (1886)

Core (1943) only knew the species from two sites in northern Mexico. Several additional collections are now known from this region, plus two sites in Texas, both in Brewster County (Glass Mountains and near Pena Colorado, just south of Marathon) where it occurs as a crevice plant on a specific geological outcrop of Devonian age known as Caballos Novaculite.

8. *PARONYCHIA* *MACCARTII* Correll (1963) Fig. 3

The species is known only by the type material which was reportedly collected in tight red sandy soil along Farm Road 649, 8.3 miles south of Mirando City in eastern Webb County. The collections were made by Mr. William McCard and students from Laredo Junior College in March of 1962. I have made numerous visits to this area over a several year period in hopes of locating the plant but these have proven unsuccessful. The plant is strikingly different from other species of *Paronychia* in the region, much resembling *P. wilkinsonii* of trans-Pecos Texas but clearly different from the latter.

Botanists, and wild flower enthusiasts generally are urged to look for extant populations and report such findings to the present author or else call this to the attention of appropriate authorities so that some efforts might be taken to protect such living individuals.

9. *PARONYCHIA* *VIRGINICA* Spreng. (1825)

*Paronychia scoparia* Small (1897)

*Paronychia parksii* Cory (1944)

*Paronychia virginica* var. *scoparia* (Small) Cory (1944)

*Paronychia virginica* var. *parksii* (Cory) Chaudhri (1968)

Chaudhri (1968) did not recognize the var. *scoparia*, thinking it synonymous with his var. *virginica*. He did recognize *P. parksii*, but only as a variety of *P. virginica*. I tend to agree with Correll (1970) who notes that *P. parksii* "appears to be little more than a habit variation of *P. virginica* var. *scoparia*". This is also implied in Chaudhri's comment (p. 140) that spreading versus erect habits can be environmentally induced when plants are grown from seed. Since *P. virginica* shows a

continuous distribution on limestone soils from northcentral to central Texas I see no compelling reasons to assign nomenclatural status to the somewhat larger but variable plants from the latter area.

10. *PARONYCHIA CONGESTA* Correll (1966) Fig. 4

This species is known from only two collections from approximately the same site, one by its original collectors (Correll & Wasshausen, about one mile south of Thompsonville, on rocky slopes of breaks) and one by the present author who, after several hours' search, observed only four plants at a site 0.8 miles south of the old site of Thompsonville. The latter inhabitation is now totally replaced by a single small Exxon pump station.

*Paronychia congesta* is seemingly most closely related to the more western perennial, *P. jamesii*, but has a more congested inflorescence with gradually tapered sepals and non-divergent awns. In my opinion it is a "good" taxon deserving of specific rank.

Attempts should be made to locate additional individuals of this rare and endangered taxon so that appropriate action might be made to conserve such populations.

11. *PARONYCHIA LUNDELLORUM* B. L. Turner, sp. nov.

*Paronychia setacea* accedens sed plantis robustis perennibus pedicellis florum longioribus.

Perennial low herb 6-24 cm tall. Leaves linear, 1-3 cm. long, 0.5-0.7 mm. wide, rigid, erect-spreading, minutely and evenly pubescent, the apices with a short mucro. Stipules ca. 1/2 as long as the leaves. Calyx urn-shaped, ca. 2.5 mm long, decidedly pedicellate, the pedicels 0.5-1.0 mm long, especially in vernal forms; lobes of the sepals ca. 2 mm long, abruptly terminated by a pronounced mucro, 0.75-1.00 mm long, that diverges at a nearly right angle to their axis, the fused portion of the calyx body expanded and prominently white strigose, the lobes glabrous or nearly so, each of the sepals possessing a well-defined, hyaline margin.

TYPE: TEXAS. Brooks Co.: in Spartina flats, 3 mi S of Falfurrias, in low pasture, on sandy soil, 21 Apr 1949, C. L. Lundell 14911 (holotype, LL).

Additional specimens examined: TEXAS. KENEDY CO.: King Ranch, Norias Division, San Jose Pasture, open sandy plain, 25 Sep 1958, Lundell & Correll 15216 (LL); Norias, hiway right of way, dune sand, 4 Dec 1948, Tharp et al. 48-19 (TEX). Kleberg

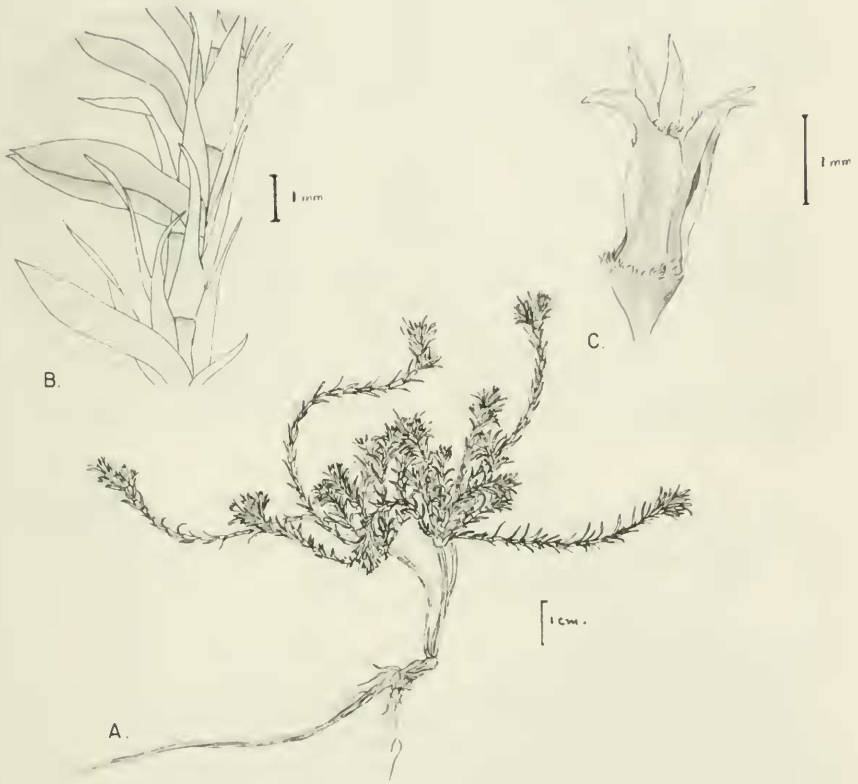


Fig 3. *Paronychia maccartii*: A. habit; B. stem, showing leaves and stipules; C. flower. (from isotype, LL).

Co.: 6.5 mi WNW of Riviera, sandy mesquite prairie, King Ranch, Santa Gertrudis Division, 6 Jul 1954, Johnston 541140 (TEX).

Paronychia lundellorum is most closely related to P. setacea but can be distinguished by its larger, more pedicillate flowers and perennial habit. It is largely confined to Southern Texas where it occurs in low, sandy, somewhat saline soils dominated by Spartina grasses. The species is superficially similar to the perennial P. congesta, which is known only from western Jim Hogg County where it occurs in calcareous soils. The latter is readily distinguished by its short, gradually acute, non-reflexed calyx awns and its emarginate (non scarious) sepals.

Previous workers, who looked critically at the type material, and published on the group have annotated these as P. setacea ("unusual form!", Hartman 1976, LL), as P. jamesii var. jamesii (Chaudhri, 1968, TEX) or as P. lindheimeri var. lindheimeri (Chaudhri, 1968; TEX). None of these taxa occurs in the region concerned and most of the confusion seems to stem from the few collections available to these two workers and to the fact that P. lundellorum occurs in a vernal form (relatively open, annual like plants) and an autumnal form (congested, perennials with shorter nodes). This is readily seen in Lundell & Correll 15216 (LL) where both forms are mounted upon the same sheet.

The species is named for Amelia A. and Cyris L. Lundell who together have collected extensively in southern Texas, adding considerably to our knowledge of the flora of this region.

## 12. PARONYCHIA MONTICOLA Cory (1944)

Paronychia nudata Correll (1966)

In my opinion Paronychia nudata belongs to a group of individuals heretofore designated as P. monticola. The holotype collected by Correll and Wasshausen in Crockett County is essentially like P. monticola; indeed, a paratype and the only other collection of P. nudata cited by Correll (Muller 3097 from Coahuila, Mexico) is cited by Chaudhri (1968) as belonging to P. monticola.

Correll (1970) in his key to species, distinguished P. monticola from P. nudata by the supposedly annual habit of the former and perennial habit of the latter. But, as noted by Chaudhri (1968), P. monticola appears to be a "biennial or, mostly, perennial herb", an observation with which I concur. Correll, in his original description, noted P. nudata to be superficially similar to the perennial P. jamesii but, strangely, did not reckon P. monticola as particularly close, presumably because he thought the latter to be annual, and that the Crockett

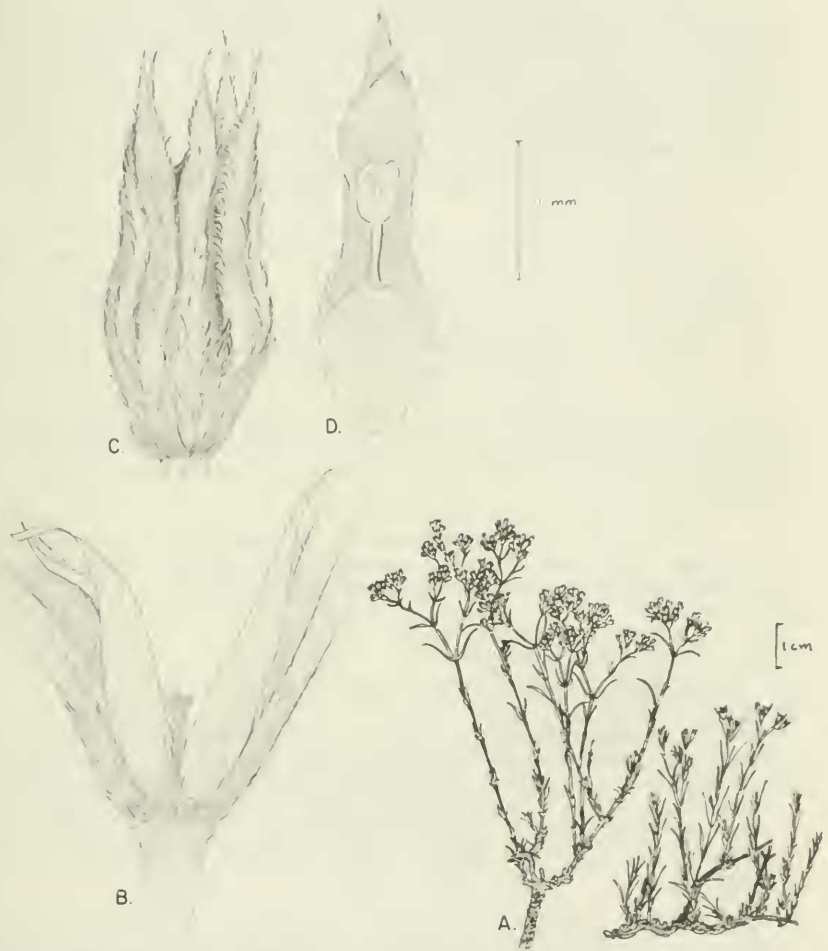


Fig 4 *Paronychia congesta* A habit; B node, showing stipules, base of leaves, and pedicel; C. flower; D. sepal with attached stamen. (from holotype, LL).

Santa Gertrudis Division, 6 Jul 1954, Johnston 541140 (TEX).

Paronychia lundellorum is most closely related to P. setacea but can be distinguished by its larger, more pedicillate flowers and perennial habit. It is largely confined to Southern Texas where it occurs in low, sandy, somewhat saline soils dominated by Spartina grasses. The species is superficially similar to the perennial P. congesta, which is known only from western Jim Hogg County where it occurs in calcareous soils. The latter is readily distinguished by its short, gradually acute, non-reflexed calyx awns and its emarginate (non scarious) sepals.

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county locality was too removed from the Davis Mountains (type area of *P. monticola*) to warrant such consideration.

The biological status of *Paronychia monticola* is moot. It is apparently sympatric with *P. jamesii* in trans-Pecos Texas and, except for its glabrousness and relatively simple caudex, strongly resembles the highly variable *P. jamesii*. It is possible that glabrous forms with relatively simple caudices have been singled out for recognition in this instance. But again two distinct species may be involved, with evidence of occasional hybridization, to judge from the variation found in these putative taxa in trans-Pecos Texas. Future field workers should attempt to resolve this problem.

### 13. *PARONYCHIA JAMESII* T. & G. (1838)

*P. jamesii* var. *praelongifolia* (1966)

*P. jamesii* var. *parviflora* Chaudhri (1968)

*P. jamesii* var. *hirsuta* Chaudhri (1968)

*Paronychia jamesii* is by far the most common, widespread, variable species in Texas being represented in the major herbaria by several hundred collections from most counties west of a line from south central Oklahoma to Del Rio (Val Verde Co.) Texas. Core (1943) did not recognize intraspecific taxa in the group but Chaudhri (1968) recognized four varieties:

1) var. *jamesii* (represented by an overwhelming list of citations); 2) var. *hirsuta*, exceptionally pubescent forms from Pecos County, Texas; 3) var. *parviflora*, a small flowered form from the Glass Mountains in Brewster County and; 4) var. *praelongifolia*, occasional forms with elongated floral bracts, the type being from Guadalupe Mountains, Culberson County, but such forms occur sporadically from Kansas, Colorado, Oklahoma to central Texas. In my opinion these several taxa are but names applied to segregating forms and have no meaningful application in the biological sense. That is, they do not apply to differentiated regional populations.

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